[The Fox.]

CURIOSITIES OF BRITISH NATURAL HISTORY.

THE FOX.

Time was when the bear and wolf, the wild boar and wild bull tenanted the forests and hills of "merrie England;" and the painted Briton, the Roman, the Saxon, and the Norman—each in their turn—entered with ardour into a chase exciting from its danger, requiring strength of arm and firmness of heart, and in which abundant opportunities offered for the display of courage and address. Now we may wander through wood and glen—over the heathy hill or wild moorland—the very spots in which these "beastes of venery" once lived, and "where they were, there they are not." The surly bear no longer makes the hollow tree of "bald antiquity," or the rift in the rock, his dwelling; the howl of the wolf wakes no longer the echoes of the night. We fear not in the wood to come suddenly upon the lair of the boar, or meet him, with fiery eye and mane erect, ready to rush forth; nor will the lowering wild bull with awful front bar our passage. They have all disappeared before the march of civilization; man has encroached upon their ancient territories, utterly extirpated them, driven the plough over their haunts, and depastured his flocks and herds in their fastnesses; nor does the peasant, as driving his team he whistles in security, dream that perhaps where he stands many a fierce contest may have taken place between the savage beast of the forest and the mighty hunter of other days. So changed, indeed, is the face of our island since the days of Caractacus, that the warrior, were he to revisit his own kingdom, would think himself in a foreign land. It is thus by man's agency on the surface itself of the earth—by clearing forests, draining morasses, banking up rivers, introducing vegetable productions alien to the soil—that he influences the condition of the wild occupants of the land; his operations, independently of bow, or spear, or gun, tending to the gradual extinction of some, the numerical reduction of others, and, *per contra*, to the naturalization of not a few. We here open a subject of the highest interest—man's agency on the earth as affecting the animal and vegetable kingdoms; and we would suggest to our reader to ponder it a little in his mind.

It is the fierce, the destructive, and the dangerous, that man first expels or extirpates; the less powerful and ferocious, though thinned, linger to a more distant date: but then sometimes a kind of reaction takes place, and man is perhaps anxious to preserve certain wild animals, in order that they may contribute to his pleasure. Hence laws, often arbitrary and severe in the extreme, are enacted, in order that the privileged few may enjoy the pleasure alone. These laws may indeed become ameliorated; but, while they continue, they operate as a check to the extirpation of certain species, which, but for such a preventive, would speedily take place. In this predicament stands the Fox, an animal which, although not strictly game, would, if not protected, soon follow the fate of the bear and the wolf, and become extinct within the limits of our island. The wild-cat, the otter, the badger, the polecat, marten, stoat, and weasel (setting aside three or four species of seal), are, in addition to the fox, the only carnivora now existing in Great Britain; and of these the three first, and especially the wild-cat and otter, are very scarce, excepting in certain localities which favour their concealment or afford them security. The fox is much more widely spread, and, in some districts, as the farmers have reason to know, is very common, and in the grey of the morning may be seen skulking away from the scene of his nightly depredations. In all ages the fox has been celebrated for its wiles and cunning, and in a country like our own, where it has more than ordinary occasion for the exercise of craft and watchfulness, it becomes doubly suspicious. Hence the most tempting bait will scarcely

ever induce it to enter a trap. The disposition of the fox is portrayed in the expression of its physiognomy. The sharp ears and muzzle, the oblique eye with a linear pupil, and the peculiar curl of the upper lip, displaying the canine teeth, and especially observable when the animal is excited and ready to snap, proclaim a mixture of craftiness, vigilance, and fierceness.

When prowling in the dusk, or watching for rabbits along the borders of the coppice, it proceeds with its limbs bent in a crouching attitude, with ears erect and gleaming eyes, intent upon its prey, and at the same time quick to take the slightest alarm and dart off to the place of its concealment. The figure at the head of this article is an admirable delineation of the fox on his twilight prowl, stealthily creeping upon his victim, yet alive to his own danger. Though the fox is nocturnal in his habits, he is not exclusively so; it is not often, however, that he ventures abroad during the day. We have ourselves once or twice seen a fox by the edge of a wood in full day; and, during a recent visit to Essex, two foxes were observed in the afternoon in a bean-field, near a farm-yard, the scene of many of their exploits. In the same farm-yard, a few weeks previously, the shepherd's dog (a powerful animal) surprised and seized a fox in the morning, who defended himself with the utmost determination, when one of the men coming to the dog's assistance (which was not needed), in endeavouring to strike the fox with a stick, struck the dog, upon which the latter let go his hold, and allowed the fox to escape.

Innumerable are the stratagems which the fox employs in the acquisition of his prey. He reconnoitres the precincts of the farm-yard, and acquaints himself with its topography, and the arrangement of the sheds and buildings; neither a high wall nor palings obstruct him; he leaps over the one, or creeps under the other, glides noiselessly to the poultry-house, and seizes his victim, often without disturbing the rest of the feathered sleepers; generally, however, he is not content with one, but puts most or all to death, for he has not only to gratify his instant appetite, but to provide against a future day. Domestic poultry, ducks, or geese, are equally acceptable. In this habit of providing for future contingencies, the fox resembles the dog, which we know buries the bones he does not want at the time, returning to them when his inclination tempts him. Thus the fox having made havoc among ducks or fowls, if time permits, carries them off, and hides them in the earth, not in a single place, but in many places, so that if one of his hoards be discovered by a brother robber, he has other resources to apply too. Dr. Weissenborn assures us, that "a few years ago a fox entered in broad daylight the poultry-yard of the parsonage of Sentzke, in Westhavelland, and succeeded in killing twenty fowls, and burying nineteen in the neighbouring garden. When the animal was entering the garden with the twentieth, it was observed, and took to its heels. On account of its burrow being distant, it had availed itself of so favourable an opportunity of laying in a store near the yard, which for several days and nights running it tried to bring away to a safer place, until it was caught in one of the traps set for it." To this he adds, "I can testify that a fox will even in winter save half a hare towards the night to come. In my youth, one morning after a night during which there had been a moderate fall of snow, I hit upon the track of an old hare accompanied by that of a fox. I followed them into the open field about an English mile, when I came to the spot where the hare had been killed and partly devoured; but observing in the continuation of the fox's track that something had been dragged, I had the curiosity to follow it farther, and at the distance of a few hundred paces found the posterior half of the hare in an excellent condition, buried in the snow under a little bush. I confess the hare was so well carved, that I had no objection to partaking of Mr. Reynard's fare, preferring at dinner—

'No doubt,
A rogue with venison, to a saint without.'"

Rabbits, pheasants, and partridges are in some places destroyed in great numbers by the fox; the former indeed are especial favourites as food, and in surprising them the subtle animal displays the most consummate address; besides these, in times of scarcity, field-mice, frogs, and even weasels and polecats, are seized and devoured. Dr. Weissenborn, however, asserts that even the severest hunger cannot compel it to eat the flesh of birds of prey.

Besides animal diet, the fox will feed upon sweet berries, and exhibits a great predilection for grapes: in our island these dainties are not within its reach, but on the Continent it visits the vineyard when the fruit is ripe, and commits considerable mischief. The sweetness of the fruit is no doubt grateful to the animal's palate, and it may be observed that the dog soon becomes very fond of sugar. This partiality for sweets leads the fox occasionally to plunder the bee-hive, as it is asserted, notwithstanding the stings of the enraged inhabitants of the overturned temple of honey-stored cells, from whose annoyance he rids himself by rolling upon the ground, and ultimately secures his prize. For ourselves, we never knew any instance of this kind, though many of the devastation of poultry-yards adjoining to gardens in which were rows of bee-hives. We do not deny, however, that instances of this animal plundering the hive may have happened. The kinkajou of South America, the ratel of Africa, and other animals, plunder the nests of the wild bee.

The fox dwells in a solitary burrow, which he excavates in a secluded place, generally on the edge of a forest, or copse, and always in a situation abounding with his favourite food. In his selection of a proper spot he is much influenced by the nature of the country; forming his domicile, according to circumstances, in the neighbourhood of a warren, a preserve of game, or a farmyard, especially where tangled brushwood and rough and broken ground favour its concealment. In this burrow, which in the sportman's language is called its 'earth,' it usually remains concealed during the day. It is not always that the fox digs his own retreat, he not unfrequently appropriates to himself the burrow of the badger, or even that of the rabbit, which he easily enlarges sufficiently for his convenience. Sometimes the fox dwells unsuspected in the very centre of the area of his depredations, and where no one would think of looking for him. We know of an instance in which the burrow of a fox, which had sadly thinned the stock of poultry, was by accident found in a part of the garden appropriated for pea-sticks and various sorts of garden rubbish.

Mr. Daniel ('Rural Sports') defends the fox from the accusation of killing lambs, urged against it by the farmer. Mr. Bell, on the contrary, says, "it has been known not unfrequently to carry off a young lamb." We should certainly say from our own experience that young lambs are very frequently the prey of this sanguinary animal, and that his title of "robber of the fold" is by no means misapplied. More than once have we heard the farmer's lamentations and vows of vengeance on discovering the palpable proofs of the caitiff's depredation. In Germany, as Dr. Weissenborn assures us, the fox destroys the roe and even the young of the red-deer. In the forests during the winter the fox, he observes, "fares most abundantly when the snow is from one and a half to two feet deep, and a hard frost succeeding a short thaw has produced an icy crust suf-

ficiently firm to carry the fox, but not the roe." Not only is the swiftness of the former then comparatively much greater, but the roe or young red-deer to which it gives chase soon bleeds at the shins, and falls an easy prey to its pursuer.

The female, upon whom devolves the entire labour of rearing her cubs, breeds in April. She produces from five to eight at a birth, preparing for them a nest at the bottom of her burrow, lining it with dry leaves, moss, and hay. At this period her maternal solicitude is strongly manifested: she employs every artifice to conceal her offspring from discovery, and defends them with indomitable courage; and if she suspect her retreat be discovered, she carries them away one by one to a place of greater safety. A female fox has been known to carry a cub in her mouth during a severe chase of nearly an hour, and only drop it at last from the absolute impossibility of longer retaining her hold compatibly with the freedom of breathing, so necessary in her harassing situation. Mr. Daniel ('Rural Sports') has recorded a curious instance in which the female fox departed from her ordinary habits, in order to the more perfect security of her young. In April, 1784, a terrier belonging to the narrator of the circumstance scented a fox to the bottom of a pollard-tree, then up the tree, which the dog vainly made repeated efforts to ascend, till at length the whipper-in, climbing the tree, lifted the dog before him; there in a hole twenty feet from the ground was the fox, with four cubs which had been littered there for safety, and to this hiding-place she must have ascended by the assistance of the roughness of the bark and the boughs alone.

The young ones, or cubs, of the fox are very playful, and, as we have seen puppies do, are fond of endeavouring to catch their own tails, turning round and round in the effort; at about the age of four months they leave the female's protection and shift for themselves. When captured, even at the earliest age, and brought up in confinement, with every kindness, the fox still retains its suspicious character: it may perhaps display some degree of familiarity towards the person who has attended to it, and supplied it with food, but it manifests nothing of the gratitude and attachment of the dog, and on the approach of strangers will almost always conceal itself, or, should they attempt to touch it, repel their advances with a bite. To attempt to tame a full-grown fox is useless: it exhibits the utmost impatience of restraint—tries by every means to regain its freedom, and if it cannot succeed, pines, becomes spiritless and dejected, and soon dies. It is essentially an animal "feræ naturæ," to which liberty is dearer than life or limb.

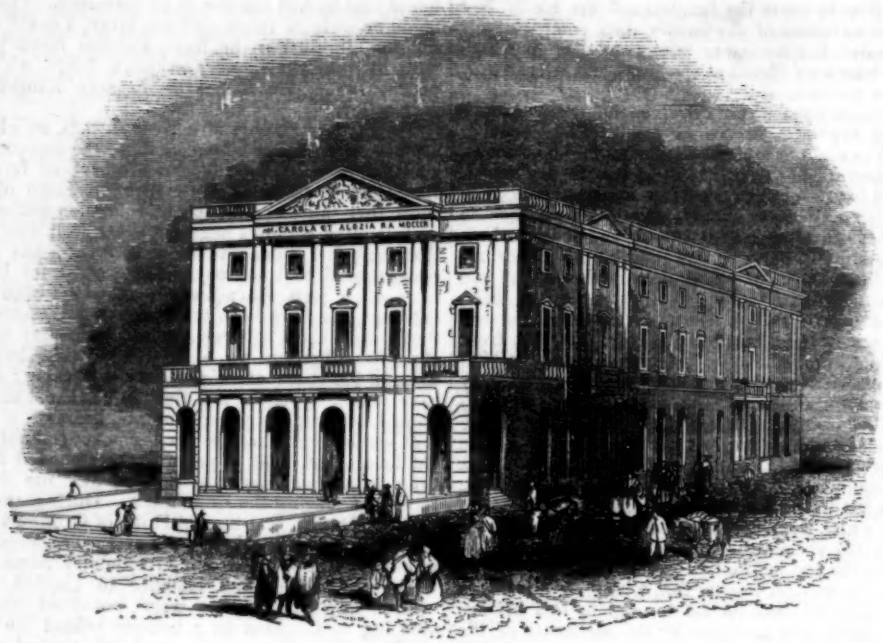
Indeed there are instances well authenticated of foxes caught by the leg in a trap freeing themselves by biting off the confined and perhaps broken member. Dr. Weissenborn cites a case, in which a person whom he knew broke one of the fore-legs of a fox with a rifle bullet, when the animal, being hampered and annoyed by the leg dangling about, turned angrily round and bit it off. He relates other instances, which we will not quote, proving the creature's indomitable resolution and endurance of pain. Mr. Bell adduces the following interesting fact from a correspondent, which shows that when deprived of a limb, the fox, as if conscious of his condition, departs from his usual method of seeking safety by flight before the hounds. "I remember once, when out hunting, the hounds found a fox, who did not leave the cover, but kept running from one part of it to another. Just as a hound was about to seize him he jumped over the dog, and thus saved himself. This tedious sport was kept up for a long time, till Reynard, being thoroughly tired with so many leaps and so many enemies, at last fell a prey to them. The huntsman on taking him up found that he had lost one of his fore-legs. The cover being entirely of furze, and not large, I could see all sides of him during the hunt, and was much pleased with the many elegant and quick leaps which the poor three-legged fox made to save himself from destruction."

The voice of the fox is a sort of yelp, which, however, it never exerts when watching the movements of its prey, or creeping into the preserve or farmyard. Bewick unhesitatingly asserts from his own observations that the dog and fox will breed together, notwithstanding Buffon's negative. Mr. Bell, who admits that the belief is general, observes that he has in vain endeavoured to trace any valid ground for it. We have often seen sharp-nosed dogs which were called fox-dogs, and have been at the same time assured that they were a cross between the two animals: but on a close investigation we always found that important links in the chain of evidence were wanting; and we have reason to believe that Bewick has based his assertion on nothing more than common hearsay.

It would seem that the fox becomes attached to his old haunt, and that if caught and removed from it even to a great distance, he has, like the dog, the faculty of tracing the road home. During the time, says Mr. Daniel, that the old Duke of Grafton kept his hounds at Croydon, his Grace's pack were occasionally supplied with foxes from Whittlebury forest: they were sent in the first instance to London, in the venison-cart, and thence were conveyed the next morning to Croydon in a hamper behind the duke's carriage, when they were immediately turned out before the hounds. A stout fox, conveyed in this manner, was hunted and escaped. Some time afterwards the huntsman suspected that the same animal had been a second time sent from Whittlebury; and to verify the fact, if it happened again, he had him marked previously to his being chased: he escaped. A third time was he taken in his old haunts, and at length fell a victim to the hounds.

[To be continued.]

The Mimulus.—The musk-plant, which is so familiar to almost everybody, is a species of Mimulus, or Monkey-flower; but the gardens have been greatly enriched of late years with a Mimulus which is raised from seed, in almost endless variety, and whose flowers are very large. We have also a Mimulus of a bright red colour, called Mimulus Cardinalis—and between the former, with large yellow flowers, variously spotted with brown or purple, and the Cardinalis, there are many hybrid varieties. The form of the flower is odd, something like a bell, with divisions, and the edges, as far as they are divided, turned over; these lappets, and the inside of the flower also, are strangely blotched and spotted with brown or red, or reddish purple on a cream-colour or yellow ground; and when planted in a moist situation, it will grow and bloom from spring to winter. It is exceedingly fond of water, and is one of the very best plants that can be placed round the moist edge of a pond or tank. It strikes root at every joint, and will grow even swimming on the surface of water. So rapidly does it strike root, and so numerous are the joints, that if a plant were cut into pieces, and sown as seed, there would be numerous young plants come up even from joints which had not a quarter of an inch of stem. When it was first introduced, great pains were taken with it for its novelty; but its rapid and weedlike growth prevented it from being long estimated, although there can hardly be conceived a more brilliant subject for clumps in the geometrical or Dutch gardens. Small bits, planted six inches apart, and constantly watered, will soon cover the bed; and they will require nothing more than watering, keeping clear from weeds, and cutting back when too straggling. If raised from good seed, there will hardly appear two alike; but it is difficult to procure good seed, and the best way is to save it yourself from the most striking flowers. They will grow in any kind of soil, with plenty of moisture; and if sown in the autumn, in a green-house, will bloom the next summer. —*The Gardener and Practical Florist.*



[The Casa Lonja.

THE CASA LONJA, OR EXCHANGE, OF BARCELONA,

AND ITS GRATUITOUS ACADEMIES.

BARCELONA, the capital of the province of Catalonia, and justly considered as the second city in Spain, on account of its commerce, the intelligence of its inhabitants, and their advancement in the arts and sciences, has been already described by us in No. 259. But in this article we purpose to enter more fully into the description of its Casa Lonja, or Exchange; an establishment of which the inhabitants are justly proud.

This edifice is beautifully situated in the largest square of Barcelona, called *La Plaza del Palacio*, close to the sea-gate and Custom-house, and in front of the Captain-General's palace, from which the square takes its name.

The project of an establishment where the merchants and tradesmen might assemble for the transaction of business was first formed in the year 1339, but nothing was done until 1383, when a curious Gothic edifice was erected, containing various offices; but its principal merit was a spacious and lofty hall, supported by four columns, which was the Exchange, according to the usual acceptation of the term. In 1770 the authorities resolved to form an establishment worthy of the commercial importance at which Barcelona had arrived; and the construction of a new edifice was intrusted to a Catalonian artist named Don Juan Soler, who commenced it in 1772. He died in 1794, and this magnificent work was completed by his son. The old building was demolished, with the exception of the above-mentioned hall, which was preserved not only on account of the veneration of the inhabitants for this monument of their ancient prosperity, but because its solidity was unimpaired, that it was a fine specimen of Gothic architecture, and was peculiarly adapted to the purpose to which it was built. It is 116 feet long, 75 wide, and its height extends to the second story of the new edifice, which is built over it. The engraving at the head of this article will impart a correct idea of this magnificent structure. The principal entrance is from the *Plaza del Palacio*, or Palace Square. In the *patio*, or interior quadrangle, are four white-marble statues, representing Europe, Asia, Africa, and America: they are by Catalonian sculptors, and are extremely well executed. The staircase is very fine: it is double, with two spacious landing-places. At the foot are two statues in white marble emblematical of Commerce and Industry.

On the principal floor is a noble hall where the public examinations take place; likewise the saloon where the Junta of Commerce hold their sittings: the latter is adorned with several statues and groups, among others an excellent copy of the Laocoon; the painted ceiling exhibits allegorical subjects suited to the Institution. The furniture is rich and in excellent taste, and under a superb canopy of crimson velvet is a portrait of the young Queen Isabel. On the same floor is the hall of the Tribunal of Commerce, fitted up and decorated in accordance with its destination.

The Casa Lonja is built entirely of freestone. The pavement of the Exchange, where the merchants assemble, the flooring of all the official saloons on the first story, the balustrades of the balconies, and those of the principal staircase, are of white marble.

In the other parts of the building are the gratuitous academies, founded by the Junta of Commerce. They are noble proofs of the interest taken by the mercantile body in the welfare and improvement of the inhabitants, and have excited the admiration of those foreigners who have inspected them.

The first academy is that for the study of Navigation. The course lasts two years, and includes every part of nautical science:—there are globes, charts, nautical and mathematical instruments of all kinds, and able professors to teach the use of them; the lessons consist of two hours daily excepting during the vacations.

The gratuitous School of Design is of a very superior description, and is numerously attended. Its officers are, a director-general, two subdirectors, four chief and seven under masters; all of whom are well qualified, and are most punctual and assiduous in

attending to their respective classes. All the needful materials for prosecuting their studies are supplied gratuitously to the pupils. The fittings up of the different rooms are convenient, and during the winter season there is a small jet of gas in front of each desk. Barcelona being a large manufacturing city, great attention is paid in this department to instruction in those branches of the art applicable to the more useful purposes; such as designs for the ornamental parts of architecture, for the decoration of houses, for all sorts of furniture, and the invention of patterns for printed cottons.

In the academy for engraving, the copper-plates, burines, and whatever other articles the professors may state to be necessary for their pupils, are supplied by the Junta gratuitously.

The school for oil-painting is supplied with a variety of pictures selected from the gallery of the Casa Lonja, where there is an extensive and valuable collection of the works of the first masters, both of the Spanish and the other celebrated schools. These paintings are copied by the pupils, and are changed for others as circumstances may require.

There is a gratuitous course of lectures on chemistry as applicable to the arts. It lasts two years—the apparatus is complete. Short-hand is also taught to the pupils, in order that they may the more readily profit by the lectures of the different professors.

The other gratuitous classes in the Casa Lonja are—book-keeping by double entry; natural philosophy, the museum and apparatus are extensive and complete; political economy; architecture; agriculture and botany; practical arithmetic and geometry; geography; mathematics; the French, English, and Italian languages; civil engineering—for the study of this useful science there are models of the most useful and perfect machines which have been invented in countries where the greatest progress has been made. There is also a steam-engine, and a gasometer, which supplies the gas (made from fish-oil), for the school of design, &c. already spoken of. The pupils are taught to apply the theory they have learnt, by constructing machines on a small scale, for which the necessary tools and materials are supplied gratuitously.

In the school of naval architecture, also, the same facilities as to models and tools are afforded; and the principles of ship-building, as regards both ships of war and merchant-vessels, are practically developed.

The Junta of Commerce of Barcelona not only established these magnificent gratuitous academies, but it grants annual premiums to those pupils who have most distinguished themselves; these premiums consist of copies of the best works on the different studies. The Junta also grants pensions to some of the young students, in order that they may proceed to foreign countries, or to Madrid, to improve themselves in the fine arts. These pensions are continued for such period as the Junta may consider necessary for the accomplishment of the object in view.

In addition to these benefits conferred on the inhabitants of Barcelona, the Junta publishes, at its own expense, a Journal of Agriculture and Art, in order to disseminate more widely the knowledge imparted in their gratuitous schools.

USEFUL APPLICATIONS OF THE BEECH-TREE.

[Concluded from page 160.]

THE BEECH-OIL PROJECT OF QUEEN ANNE'S REIGN.

In our former article on this subject, we intimated that there were circumstances connected with the economical uses of the beech-fruit, or 'mast,' deserving of a little attention. The matter was of no less importance than the projecting of a powerful and wealthy joint-stock company for the manufacture of beech-oil from the fruit of the beech-tree; a project which, one hundred and twenty years ago, narrowly failed in drawing many persons into a "bubble." Before speaking of this notable scheme, it will be right to describe the fruit from whence the oil was to be obtained.

The fruit contains two nuts within the calyx or sheath; and when ripe the calyx opens, and the nuts frequently drop out by themselves. Each nut has three very sharp angles, and contains an oleaginous substance fit to eat. Gerard speaks thus of the excellent effect which the nuts had in fattening swine, deer, and pigeons:—"With these mice and squirrels be greatly delighted, who do mightily increase by feeding thereon; swine also be fattened herewith, and certain other beasts; also deere do feed thereon very greedily. They be likewise pleasant to thrushes and pigeons." Parkinson, writing in 1640, says that the beech is planted in parks, forests, and chases, to feed deer; but in other places to fatten swine, "whose fat," he adds, "will be softer than theirs that are fattened with acorns." Modern opinions, however, have reversed this doctrine; that is, if Parkinson meant the "softening" of the fat as a favourable circumstance. The fat of the animal becomes oily, does not keep long, and wastes in boiling. The wild animals, such as badgers, seek for these nuts with avidity, and fatten speedily on them. Evelyn speaks of dormice, which, "harbouring in the hollow trees, grow so fat, that in some countries abroad they take infinite numbers of them, I suppose to eat. What relief they give to thrushes, blackbirds, fieldfares, and other birds, everybody knows."

These, then, are the portions of the beech-tree from which it was proposed, in Queen Anne's reign, to produce oil for lamps and other purposes. Aaron Hill, the dramatic writer, was the mover of the wires in this piece of commercial machinery. We have now before us three pamphlets, published in 1714 and 1715, the titles of which will speak most eloquently to the minds of those who know anything about joint-stock projects. One of them runs thus:—'Proposals for raising a Stock of One Hundred Thousand Pounds; for laying up great quantities of Beech-mast for Two Years; at an interest of Forty-five Pounds per Cent. per Annum to the Subscribers, and upon a Security whereby they will always have in their own hands above ten times the value of the sum they contribute. To which is added, a particular Account of the Nature, Benefit, and Design of the Undertaking.' The second pamphlet somewhat varies the tempting offer in its title-page:—'An Impartial Account of the Nature, Benefit, and Design of a New Discovery and Undertaking, to make pure, sweet, and wholesome Oil from the Fruit of the Beech-tree. By Authority of Her Majesty's Royal Letters Patent, under the Great Seal of Great Britain. With particular Answers to every Objection which has been made, or may reasonably be conceived against it. And Proposals for raising a Stock not exceeding Twenty Thousand Pounds: wherein every Hundred Pounds advanced will entitle to an Annuity, for Fourteen Years, of Fifty Pounds per Annum, and for a less Sum proportionably, upon a good and solid Security.' Of what nature was this security, and the machinery of the project, we are informed by Aaron Hill himself, in a third pamphlet, purporting to be an 'Account of the Rise and Progress of the Beech-Oil Invention, and all the Steps which have been taken in that Affair, from the first Discovery to the present Time. As also, what is further designed in that Undertaking: 1715.'

In this last-mentioned pamphlet, which consists of somewhat above a hundred pages, the first ten or twelve are devoted to a few high-toned remarks on the ab-

surdity of laughing at a new project merely because it seems new and strange. About an equal space is devoted to notices of past projects which had, in their day, seemed equally absurd. Having thus cleared the ground for his beech-oil project, his patriotism bursts forth thus:—"While every man is ready enough to run forward with the herd, and complain how many millions the nation stands indebted for, nobody considers himself concerned so far as to consider by what means the public credit may be cleared from so prodigious an incumbrance. We are poorly contented to look upon it as a thing impossible; and yet is this giant's task an easy undertaking, and cannot but be universally acknowledged so, as soon as the proposition shall be made in parliament, where immediate birth may at any time be given to a fund which, without the least oppression or complaint, will be capable to supply at once as many millions as will pay off all the debts of the nation, and deliver us from *poor's rates*, *excise*, *land-tax*, or almost any tax at all for ever after."

Hill then gives an account of the manner in which he first became acquainted with the astonishing virtues of the beech-nut. He was, he says, in Naples in the year 1700, where, having caught a cold, he was recommended to take some almond-oil, which he himself saw expressed from the almonds in the shop of the apothecary. A few days afterwards he went with a friar to Mount Vesuvius, and during their route passed through a forest of beech-trees. The trees were loaded with fruit, which hung down so as to impede his progress; and by beating them with his stick they easily became detached, and he put a few of them in his pocket. Upon tasting some of these nuts, he found a similitude of taste between them and the almonds, and he says he bethought him of trying whether the one might not be made to yield oil as well as the other. Circumstances then drove the matter out of his thoughts, and he forgot it until, in returning to England in 1712, he happened to pass through a thick beech-forest near Henley. The boughs were loaded with fruit, and his thoughts instantly recurred to his Italian adventure.

Then was the time for the formation of his project. He tells us that he made inquiries how much oil was used yearly by the manufacturers and others; how much beech-mast could be procured yearly; and how much oil could be yielded by it. He informs us that one bushel of mast will yield two gallons of excellent oil, and that England had abundance of mast for supplying all England with oil.

After being laughed at as a projector, he applied for and obtained a patent, and immediately sought to establish a joint-stock company to carry out the patent (a plan to which there is no scarcity of modern parallels). This first proposal was to obtain subscribers to a fund of twenty thousand pounds, of which a fourth should be paid down at once, and all the rest within a short time; that the subscribers should receive (from the enormity of the profits, of course) fifty per cent. for fourteen years, the limit of the duration of the patent; and that directors, &c. should be chosen. Hill says that all the sum, and "ten times more," was proffered to him in subscriptions; whereupon he reconsidered the matter, and "resolved to accept of a hundred thousand pounds more," on a different footing. Of this hundred thousand pounds the patentee modestly restricted his own share to "one-tenth of the whole," for his invention, patent, trouble, &c. The first project, with a capital of twenty thousand pounds, was for making beech-oil. The second, with the larger capital, was to be a kind of Beech-mast Granary Company, for collecting beech-mast from all quarters, and storing it till wanted; and one of its provisions, an extraordinary one in its way, was this:—"That the patentee should provide granaries, into which the directors should put storekeepers, &c., to receive and pay for whatever beech-mast the patentee should send in, at any price not exceeding one shilling per bushel; which mast they were to redeliver to the order of the patentee, upon payment of a double price per bushel to what they paid for it; by which means the subscribers, who were bound to quarterly dividends, would receive back in parts their principal and interest together, and in two years' time make a profit of cent. per cent. on their subscriptions." How could such a tempting offer be resisted?

Hill then tell us of the statistical inquiries which he made respecting the consumption of oil among the manufacturers, the extent of mast which could be procured in England, and so forth. It appears, however, that a blight which occurred among the English beech-trees so alarmed the subscribers to the granary scheme, that it became eventually knocked up. Hill thereupon built up a new scheme, for a Beech-Oil Company on a different basis, but with a similar proviso that he should have one-tenth of the whole capital to himself. To what extent Hill succeeded in getting subscribers to his third scheme does not clearly appear, for he was not a man of such note as to have his life minutely traced in our biographies: but it appears that, after negotiations and trials of three year's duration, the scheme was utterly abandoned as a failure; and we may readily guess that the subscribers were the chief losers.

But although beech-oil was thus a failure when made the groundwork of such magnificent schemes, yet it is a *bonâ fide* product in France, and is applied to many uses. Linnæus said that scarcely any oil can be obtained from the beech-mast in cold climates, and this may afford some clue to the failure in England. In France, large quantities of oil are made from it; and this oil is considered excellent not only for burning in lamps, but also for cooking, especially in frying fish. The forests of Eu and of Crécy, in the department of the Oise, have been known to yield in a single season more than a million sacks of beech-mast; and in 1779 the forest of Compiègne near Verberie, in the department of the Somme, afforded oil enough to supply the wants of the district for more than half a century. From this fact it appears that, in a favourable climate, the beech is really an important oil-producing agent.

Michaux gives the following account of the mode of procuring the oil:—The fruit is gathered as soon as it is ripe; since it is liable to be injured by the rain. It is swept together upon the ground, and is afterwards cleansed with fans or in mills; but the harvest is increased by shaking the trees and receiving the nuts upon sheets extended beneath.

Being thus collected in dry weather, and thoroughly cleansed, they are spread, like corn, in a garret or other place secure from humidity, and are frequently turned. They are found to be better and more productive when dried insensibly in this manner than when exposed to the sun. The oil is abundant only when the fruit is perfectly ripe. The season for extracting it is from the beginning of December to the end of March; if the operation be longer delayed, the nuts are liable to be injured by the warmth of the season.

The skin is commonly ground with the kernel; but as the product in this way diminishes a seventh, it is sometimes deemed more advantageous to separate them, which may be done in a flour-mill properly adjusted. The kernel is immediately reduced to a paste by a vertical stone or by a pestle mill. As the paste becomes dry in the process, water is added in the proportion of one pound to fifteen pounds of fruit, to prevent its being impaired by the heat.

The paste is sufficiently reduced, when the oil can

be discharged by the pressure of the hand. It is submitted to the press in sacks of coarse linen, of wool, or of hair; and the force is gradually applied and long continued, so that the oil may be completely expressed. Three hours at least are required in an ordinary press. To prepare the paste for a second pressure, it is pulverised, a proportion of water being added smaller than at first; and the whole is warmed by the careful application of a moderate heat. A wedge-press is commonly employed in the second operation.

With skill in the process, Michaux says that the oil is equal to one-sixth of the fruit. Its quality depends upon the care with which it is made, and upon the purity of the vessels in which it is preserved. It is then twice drawn off during the first three months after it has been made, without disturbing the dregs, and a third time at the end of six months. It arrives at perfection only when it becomes limpid, several months after its extraction. It improves by age, lasts unimpaired for ten years, and may be preserved longer than most other kinds of oil.

Mr. Loudon says—"The *tourteaux*, or remains of the nuts, from which the best oil has been extracted, are given to swine, cows, and poultry, which fatten rapidly on them. A coarser oil, for burning, is made by grinding the mast without taking off the shells, and the tourteaux from this oil, which are too hard and husky to be eaten, are used for making torches; and hence the name of *tourteau*, which is generally applied to a torch or link in France. In those districts of England where the beech-tree abounds in natural forests, it might perhaps be worth while to make beech-oil for private use, both as a substitute for olive-oil, and for lamp-oil." Steeping in water, drying, grinding, and pressing, are the processes recommended.

FISH-HOOKS.

It is remarkable to observe how keenly a sportsman—let his sport be of what kind it may—tests and estimates the quality of the implements with whose aid he carries on his avocation. The fowling-piece, the cricket-balland bat,the "eight-oared cutter,"the sailing-yacht—to say nothing of the living implements, such as horses and dogs, employed by the hunter, the racer, and the shooter,—have been by degrees brought to such a pitch of excellence, that we might almost suppose further improvement to be impossible. There are certain names, too, so fixedly attached to many of these sporting implements, as those of the most favourite manufactures, that it is evident there is a kind of standard adopted in each case, as that to which all the manufactured specimens ought to tend. How the sportsman prizes his "Manton," and the rower his "Searle" or his "Lyon," and the cricketer his "Duke," is well known in the world of sport, and partially known beyond that sphere; but it would perhaps hardly be expected by the uninitiated that, in the sport of angling, the very *fish-hooks* have a halo of excellence and beauty about them: a "Kirby" or an "O Shaughnessy" seeming to possess, in the eye of a thoroughbred angler, certain qualities which call forth his high admiration. A few words from a few anglers will afford us a little interesting information about fish-hooks and their manufacture.

One of the earliest, if not the earliest, printed book containing anything like a systematic notice of angling, is a very remarkable work under the title of 'Treatyses perteynynge to Hawkynge and Huntynge: with other dyvers playsant materes, belongynge unto Noblesse; and also, a ryght noble Treatyse of Coatarmours [coat-armoury]; a Treatyse of Fyshynge with an Angle; endying with a Treatvse whyche specyfyeth of Blasynge of Armys.' This book was printed by Wynkyn de Worde at Westminster, in 1496; and has been attributed to the pen of a lady named Dame Juliana Berners or Barnes. Much controversy has been carried on among literary antiquarians, in reference to the authorship of the volume; but of this we shall not take heed here. Suffice it to say that the 'Treatyses' are generally spoken of in connexion with the name of Juliana Berners, a spirited lady of the fifteenth century; although it must be owned that many of the details are such as we should scarcely expect to meet with from the pen of a lady.

In the 'Treatyse of Angling,' or, as it termed, 'Fyshynge with an Angle,' there is an enumeration of the various implements required by the angler, and directions how to prepare the rods, lines, baits, &c. Then follows a paragraph relating to fish-hooks, which, both from the specimen which it affords of the orthography of Henry VII.'s time, and from the manufacturing instructions which it imparts, is a curiosity in its way:—"Ye shall understonde that the moost subtyll and hardyste crafte in makynge of your harnays is for to make your hokis: for whoos makynge ye must haue fete fyles, thyn and sharpe and smalle beten: a semy clam of yren; a bender; a payr of longe and smalle tongys; an harde knyfe somedeal thycke; an anuelde [anvil]; and a lytyll hamour. And for smalle fysshe ye shall make your hokes of the smalest quarell nedlys that ye can fynde of steele; and in this wyse: ye shall put the quarell in a redde charckcole fire tyll that it be of the same colour that the fyre is. Thenne take hym out and lete him kele; and ye shal fynde hym well alayd [annealed?] for to fyle. Thenne reyse the berde with your knyfe, and make the poynte sharpe. Thenne alaye hym agayn: for elles he woll breke in the bendynge. Thenne bende hym lyke to the bende fygured hereafter in example [here is inserted representations of about a dozen kinds of fish-hooks]. And greeter hokes ye shal make in the same wyse of gretter nedles; as broderers nedlis; or taylers; or shoemakers spere poyntes; and of shomakers nayles in especyall the beste for grete fysshe; and that they bende atte the poynte when they ben assayed, for elles they ben not good. When the hoke is bendyd, bete the hynder ende abrode; and fyle it smothe for fretynge of thy line. Thenne put it in the fyre agayn, and geve it an easy redde hete. Thenne sodaynly quenche it in water; and it woll be harde and stronge. And for to have knowledge of your instrumentes, lo theyme here in fygure portrayd." This "figure portrayd" is a wood-cut representing, very rudely, as may be supposed, the implements employed in hook-making.

It would appear from these singular instructions, that anglers were wont to make their own fish-hooks in those days; and it is not improbable that such has been frequently the case since.

A century or two afterwards, old Izaak Walton, the veritable "Piscator," makes a few observations which seem to show that fish-hooks, like the other implements of fishing, were procured at certain places for which a reputation had been acquired; and the successive editions of the 'Complete Angler' point out the names of several persons who carried on those branches of manufacture. Thus, in the first edition, *Piscator*, on the "fifth day" of the narrative, is made to say:—"I will go with you either to Charles Brandons', near to the Swan in Golding Lane, or to Mr. Fletcher's, in the court which did once belong to Dr. Nowel, the Dean of Paul's, that I told you was a good man, and a good fisher: it is hard by the west end of St. Paul's Church: they be both honest men, and will fit an angler with what tackling he wants;" to which *Viator* replies:—"Then, good master, let it be at Charles Brandons', for he is nearest to my dwelling, and I pray

let's meet there." In the second edition the same names occur; but after the words "St. Paul's Church" comes this passage:—"But if you will buy choice hooks, I will one day walk with you to Charles Kerbye's, in Harp Alley in Shoe Lane, who is the most exact and best hook-maker that the nation affords. They be all three honest men." The third and fourth editions give this passage the same as the second; but in the fifth edition we have:—"I will go with you either to Mr. Margrave, who dwells amongst the booksellers in St. Paul's Church-yard, or to Mr. John Stubs, near to the Swan in Golding Lane; they be both honest men, and will fit an angler with what tackling he wants." Sir Harris Nicolas, in his costly edition of Walton and Cotton, offers a suggestion that Brandons, Fletcher, and Kerbye may have all died in the interim between the dates of publication of the second and the fifth editions; and he adds:—"The Charlez Kerbye above alluded to obtained from Prince Rupert a method of tempering his hooks, which long continued in the family. A lineal descendant of his, whose hooks for their shape and temper exceeded all others, was in 1760 living in Crowther's-well Alley near Aldersgate Street." Of the Mr. Margrave mentioned in the fifth edition, we meet with some information in a kind of advertisement appended to an early edition of Cotton's part of the 'Complete Angler;' running thus:—"Courteous Reader,—You may be pleased to take notice, that at the sign of the Three Trouts in St. Paul's Churchyard, on the north side, you may be fitted with all sorts of the best fishing-tackle, by John Margrave."

Descending from the times of Walton to those of Sir Humphry Davy, we find the accomplished author of 'Salmonia' discoursing as eloquently and energetically about fish-hooks as about any other subject to which he bent his powerful mind. This remarkable work, as is pretty well known among general readers, consists of a series of conversations about angling, divided into a certain number of 'Days,' like Walton's 'Complete Angler.' As Walton carried on his conversation by means of "Piscator" the angler, "Venator" the hunter, "Auceps" the falconer, and others; so does Davy form a conversational circle of four friends:—"Halieus," a fly-fisher, "Ornither," a field sportsman, "Poietes," a general lover of nature, and "Physicus," a natural philosopher.

On the "Sixth Day" the friends are fishing for salmon. Poietes catches a fish; but the fish, making a violent spring, escapes; and this escape gives rise to the following conversation, in which there is no doubt that Davy expressed his own individual opinions under cover of the fictitious characters:—

"*Halieus.*—You played that fish so well, that I am angry at his loss: either the hook, link, or line failed you.

"*Poietes.*—It is the hook, which, you see, is broken, and not merely in the barb, but likewise in the shank. What a fool I was ever to use one of these London or Birmingham-made hooks!

"*Hal.*—The thing has happened to me often. I now never use any hooks for salmon-fishing except those which I am sure have been made by O'Shaughnessy, of Limerick; for even those made in Dublin, though they seldom break, yet they now and then bend. *There* is a fly nearly of the same colour as that which is destroyed; and I can tell you, that I saw it made at Limerick by O'Shaughnessy himself, and tied on one of his own hooks. If you should catch with it a fish even of 30 lbs., I will answer for its strength and temper: it will neither break nor bend.

"*Poiet.*—Whilst I am attaching your present, so kindly made, to my line, pray tell me how these hooks are made? for I know you interested yourself in this subject when at Limerick.

"*Hal.*—Most willingly. I have even made a hook, which though a little inferior in form, in other respects, I think, I could boast as equal to the Limerick ones. The first requisite in hook-making is to find good malleable iron of the softest and purest kind—such as is procured from the nails of old horse-shoes. This must be converted by cementation with charcoal into good soft steel, and that into bars or wires of different thickness for different-sized hooks, and then annealed. For the larger hooks, the bars must be made in such a form as to admit of cutting the barbs; and each piece, which serves for two hooks, is larger at the ends, so that the bar appears in the form of a double-pointed spear, three, four, or five inches long: the bars for the finer hooks are somewhat flattened. The artist works with two files, one finer than the other, for giving the point and polishing the hook; and he begins by making the barb, taking care not to cut too deep, and filing on a piece of hard wood, such as box-wood, with a dent to receive the bar, made by the edge of the file. The barb being made, the shank is thinned and flattened, and the polishing file applied to it; and by a turn of the wrist round a circular pincers, the necessary degree of curvature is given to it. The hook is then cut from the bar; heated red-hot by being kept for a moment in a charcoal-fire; then plunged, while hot, into cold water; then tempered, by being put on iron that has been heated in the same fire, till it becomes a bright blue; and, whilst still hot, it is immersed in candle-grease, where it gains a black colour: it is then finished.

"*Physicus.*—Nothing seems simpler than this process. Surely London might furnish manufacturers for so easy a manipulation! And I should think one of our friends, who is so admirable a cutler, might even improve upon the Irish process; at least the tempering might be more skilfully arranged.

Thus do the salmon-fishers converse about their hooks; and there can be no doubt that the details of the conversation were meant to convey real facts and opinions.

Mr. Blaine, in his 'Encyclopædia of Rural Sports,' while speaking of the Kirby, or Kerby, who was said to have been taught the process of tempering fish-hooks by Prince Rupert, remarks:—"Mr. Charles Kirby was probably a manufacturer of iron-ware at that time, and, among other articles, of fish-hooks; for we are told that this inventive prince communicated the art to Mr. Kirby, who from his instructions first manufactured steel hooks, and that in his family the secret (if any secret it can now be) remains. Certain it is that 'Kirby hooks' are still in high estimation and extensive demand."

We believe that the large bulk of fish-hooks are now made at Redditch, the needle-making metropolis, by a great number of persons who devote their attention to this branch only. They are partly made in factories, where the division of labour is carried out, and partly in the houses of the workmen, who make the hooks for the master-manufacturers. The variety of sizes is very great, some of the hooks being as thin as the finest needles; and the shapes are almost as various as the sizes. The process differs somewhat from that described by Sir Humphry Davy as having been practised at Limerick. The wire is first *cut* to the proper length; then *barbed*, or cut in such a manner as to produce the barb; then *pointed* by means of a file; next *bent*, or put into its curved form, by passing it round a convex surface; then *hardened* in the fire; then *tempered* by the heat of a sand-bath, brought to such a temperature as to impart the requisite degree of strength and elasticity; next *scoured*, by rotating in a barrel containing emery and soap; and lastly *blued*, by placing them in a sand-bath similar to that employed in tempering.